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Studies on the Electrodeposition of Nickel. (II)

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of about 30 cm from the flue surface exceeds the boiling point of water and the vapourized ground moisture penetrates into the flue and comes into contact with the stock surface in the kiln.

Therefore, it seems that the carbon of the surface of smoking tiles is active and reacts with the water vapour in the kiln atmosphere. The reaction probably occurs at the temperature of 550°~600 °C.

Hence the authors recommend that the flue will be insulated by some means so that the ground temperature will not exceed a certain limit, below the boiling point of water.

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54. Studies on the Electrodeposition of Nickel. (II)

Kiyokado Nishihara and *Seizo Tsuda.*

When nickel is electrodeposited from its sulphate solution, there occurs an internal stress in the deposit which causes the deflection of the deposit.

In the previous report, the Report of the Inst. for Chemical Ressearch Kyoto Univ. Vol. 18 (July, 1949), we mentioned the influence of impurities in the solution on the degree of contraction of nickel deposit. Now we measure the influence of temperature on the deflection of deposit by means of contractometer. The degree of the deflection of the contractometer is found to decrease when temperature is raised from room temperature to about 70°C and to increase above 70°C.

The results of the measurement of hydrogen content occluded in the deposit and the parameter of electrodeposited nikel lattice from room temperature to 84°C are given in Table 1.

Table 1.

Temp. of Electrolyte (°C)	Quantity of occluded Hydrogen (cc/100g Ni)	Parameter by X-ray analysis (A)	Parameter by Electron Diffraction (A)
25	145.51	3.533	3.534
40	107.29	3.530	—
63	86.28	3.519	3.526
75	—	3.523	—
84	129.95	3.531	3.554

As shown in Table 1, the hydrogen content in the deposit and parameter measured by X-ray analysis, as well as by electron diffraction method have the same tendency and the minimum value at about 70°C. The parameter measured by electron diffraction method is always larger than that by X-ray analysis to the same sample.

It is concluded that internal stress in electrodeposited nikcl is minimum at the temperature of electrolysis about 70°C.